

WHAT IS CLAIMED IS:

1. An electronic device that includes:

a storage unit for storing map data including figure data formed of at least shape point coordinate array data;

an execution unit for executing given processing based on the map data stored in the storage unit;

a reception unit for receiving update information supplied from an outside, wherein the update information is for updating the map data stored in the storage unit, wherein the update information includes specifying information for specifying updated figure data that is to be updated in the map data and new figure data, the new figure data which the updated figure data is updated with and is formed of at least shape point coordinate array data, and wherein the specifying information and the new figure data are correlated with each other; and

an update unit for, when the update information is received, specifying the updated figure data from the map data in the storage unit and updating the specified updated figure data with the new figure data,

the electronic device comprising:

a determination unit for determining whether an initially-continuous figure has a discontinuous portion in a connection portion between the new figure data and an adjacent figure data, wherein, after updating by the update unit, the adjacent figure data is not updated in the map data stored in the storage unit and is adjacent to the new figure data; and

a shape correction unit for moving, when the initially-continuous figure is determined to have the discontinuous portion in the connection portion, at least one of an end shape point of the new figure data and an end shape point of the adjacent figure data, wherein each of the two end shape points is included in a plurality of shape points and corresponds to the discontinuous portion, so as to bring the two end shape points into correspondence,

wherein a shape-corrected map data that is shape-corrected by the shape correction unit is stored in the storage unit or both of determining by the determination unit and moving by the shape correction unit are executed when the map data is read from the storage unit in accordance with executing the given processing.

2. The electronic device of claim 1,

wherein, when the shape correction unit moves at least one of the two end shape points, the shape correction unit also moves at least one of shape points linked to the moved end shape point via at least one of segments.

3. The electronic device of claim 2,

wherein, when the shape correction unit moves at least one of the shape points linked to the moved end shape point, the shape correction unit moves at least one of the shape points in parallel by a same amount as that of the moved end shape point.

4. The electronic device of claim 2,

wherein, when a group of shape points, wherein the group of shape points is a subset of the plurality of shape points, is linked via a group of segments with the moved end shape point, the shape correction unit does not move a farthest shape point of the group of shape points as a reference while the shape correction unit moves the moved end shape point and remaining shape points, wherein the remaining shape points are shape points other than the farthest shape point of the group of shape points, based on respective distances from the farthest shape point to the moved end shape point and the remaining shape points, wherein amount of moving of each of the moved end shape point and the remaining shape points is increased with increasing distance from the farthest shape point.

5. The electronic device according to claim 4,

wherein the shape correction unit moves each of the moved end shape point and the remaining shape points by an amount of moving proportional to each of the distances from the farthest shape point.

6. The electronic device of claim 1,

wherein the determination unit determines the initially-continuous figure has the discontinuous portion in the connection portion based on a distance between the two end shape points of the new figure data and the adjacent figure data.

7. The electronic device of claim 6,

wherein the determination unit determines the initially-continuous figure has the discontinuous portion in the connection portion based on consistency between attributes assigned to the end shape points of the new figure data and the adjacent figure data in addition to the distance between the two end shape points of the new figure data and the adjacent figure data.

8. The electronic device of claim 1,

wherein the determination unit determines the initially-continuous figure has the discontinuous portion in the connection portion by converting shape point coordinate array data forming figure data included within a given area of the new figure data including the connection portion and shape point coordinate array data forming figure data included within a certain area of the adjacent figure data including the connection portion, respectively into raster image data representing figure shapes, and executing figure shape comparison using the raster image data.

9. A computer program product that includes a computer usable medium and is used in an electronic device that includes:

a storage unit for storing map data including figure data formed of at least shape point coordinate array data;

an execution unit for executing given processing based on the map data stored in the storage unit;

a reception unit for receiving update information supplied from an outside, wherein the update information is for updating the map data stored in the storage unit, wherein the update information includes specifying information for specifying updated figure data that is to be updated in the map data and new figure data, the new figure data which the updated figure data is updated with and is formed of at least shape point coordinate array data, and wherein the specifying information and the new figure data are correlated with each other; and

an update unit for, when the update information is received, specifying the updated figure data from the map data in the storage unit and updating the specified updated figure data with the new figure data,

the computer program product comprising:

a first instruction group for determining whether an initially-continuous figure has a discontinuous portion in a connection portion between the new figure data and an adjacent figure data that is, after updating by the update unit, not updated in the map data stored in the storage unit and is adjacent to the new figure data; and

a second instruction group for moving, when the initially-continuous figure is determined to have the discontinuous portion in the connection portion, at least one of an end shape point of the new figure data and an end shape point of the adjacent figure data, wherein each of the two end shape points is included in a plurality of shape points and

corresponds to the discontinuous portion, so as to bring the two end shape points into correspondence,

wherein a shape-corrected map data that is shape-corrected by the second instruction group is stored in the storage unit or both of determining by the first instruction group and moving by the second instruction group are executed when the map data is read from the storage unit in accordance with executing the given processing.

10. A map update method used in an electronic device that includes:

a storage unit for storing map data including figure data formed of at least shape point coordinate array data;

an execution unit for executing given processing based on the map data stored in the storage unit;

a reception unit for receiving update information supplied from an outside, wherein the update information is for updating the map data stored in the storage unit, wherein the update information includes specifying information for specifying updated figure data that is to be updated in the map data and new figure data, the new figure data which the updated figure data is updated with and is formed of at least shape point coordinate array data, and wherein the specifying information and the new figure data are correlated with each other; and

an update unit for, when the update information is received, specifying the updated figure data from the map data

in the storage unit and updating the specified updated figure data with the new figure data,

the map update method comprising:

a first step of determining whether an initially-continuous figure has a discontinuous portion in a connection portion between the new figure data and an adjacent figure data that is, after updating by the update unit, not updated in the map data stored in the storage unit and is adjacent to the new figure data; and

a second step of moving, when the initially-continuous figure is determined to have the discontinuous portion in the connection portion, at least one of an end shape point of the new figure data and an end shape point of the adjacent figure data, wherein each of the two end shape points is included in a plurality of shape points and corresponds to the discontinuous portion, so as to bring the two end shape points into correspondence,

wherein a shape-corrected map data that is shape-corrected by the second step is stored in the storage unit or both of the first and second steps are executed when the map data is read from the storage unit in accordance with executing the given processing.